MATERIAL SAFETY DATA SHEET

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SRM Number: 3005
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SRM Name: p-Xylene in Methanol

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SECTION I. MATERIAL IDENTIFICATION

Material Name: p-Xylene in Methanol

Description: SRM 3005 consists of two 5-milliliter sealed borosilicate glass ampoules containing approximately 2.5 mL of a solution of p-Xylene in methanol.

Other Designations: **p-Xylene** (benzene, 1,4-dimethyl-; p-dimethylbenzene; 1,4-dimethylbenzene; p-methyltoluene; 4-methyltoluene; 1,4-xylene; xylene; p-phenylenebis [methylene]; p-xylol) in **Methanol** (methyl alcohol; wood alcohol; methyl hydroxide; carbinol; monohydroxymethane; wood spirit; wood naphtha; methylol)

Name	Chemical Formula	CAS Registry Number
Methanol	CH_3OH	67-56-1
p-Xylene	C_8H_{10}	106-42-3

DOT Classification: Methanol; UN1230; Packing Group II; Hazard Class 3.

SECTION II. HAZARDOUS INGREDIENTS

Hazardous Components	Nominal Concentration (%)	Exposure Limits and Toxicity Data
Methanol	99	OSHA TWA: 260 mg/m^3 (200 ppm)
		NIOSH recommended TWA (skin): 260 mg/m^3 (200 ppm) (10 h)
		NIOSH recommended STEL (skin): 325 mg/m^3 (250 ppm)
		OES, UK TWA (skin): 266 mg/m^3 (200 ppm)
		OES, UK STEL (skin): 333 mg/m^3 (250 ppm)
		Human, Inhalation TC_{LO}: 86 000 mg/m^3
		Human, Oral LD_{LO}: 143 mg/kg
		Man, Oral TD_{LO}: 3 429 mg/kg
p-Xylene	1	ACGIH TWA: 100 ppm
		ACGIH STEL: 150 ppm
		OSHA TWA: 435 mg/m^3 (100 ppm)
		NIOSH recommended TWA: 435 mg/m^3 (100 ppm) (10 h)
		NIOSH recommended STEL: 655 mg/m^3 (150 ppm)
		UK OES TWA (skin) (mixed isomers): 220 mg/m^3 (50 ppm)
		UK OES STEL (skin) (mixed isomers): 441 mg/m^3 (100 ppm)
		Rat, Inhalation LC_{50}: 4 550 ppm, 4 h Rat, Oral LD_{50}: 3 910 mg/kg

SECTION III. PHYSICAL/CHEMICAL CHARACTERISTICS

Methanol	p-Xylene
Appearance and Odor: a clear, colorless liquid with a characteristic alcoholic odor	**Appearance and Odor:** a clear, colorless liquid with a sweet odor
Relative Molecular Mass: 32.04	**Relative Molecular Mass:** 106.17
Density: 0.7914 g/m^3	**Density (water = 1):** 0.8611 g/m^3
Boiling Point: 65 °C (149 °F)	**Boiling Point:** 138 °C (280 °F)
Freezing Point: –94 °C (–137 °F)	**Freezing Point:** 13 °C (55 °F)
Vapor Pressure (@ 20 °C): 97.25 mmHg	**Vapor Pressure (@ 25 °C):** 8.6 mmHg
Evaporation Rate (butyl acetate = 1): 4.6	**Evaporation Rate (butyl acetate = 1):** 0.7
Viscosity (@ 20 °C): 0.59 cP	**Viscosity (@ 20 °C):** not available
Water Solubility: soluble	**Water Solubility:** insoluble
Solvent Solubility: soluble in ether, benzene, alcohol, acetone, chloroform, ethanol, ketones, and most other organic solvents	**Solvent Solubility:** soluble in alcohol, ether, benzene, acetone, and organic solvents

NOTE: The physical and chemical data provided are for the pure components. Physical and chemical data for this methanol/p-xylene solution do not exist. The actual behavior of the solution may differ from the individual components.

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

Methanol

Flash Point: 11 °C **Method Used:** Closed Cup **Autoignition Temperature:** 385 °C

Flammability Limits in Air (Volume %): **UPPER:** 36
LOWER: 6.0

p-Xylene

Flash Point: 27 °C **Method Used:** Closed Cup **Autoignition Temperature:** 528 °C

Flammability Limits in Air (Volume %): **UPPER:** 7.0
LOWER: 1.1

Unusual Fire and Explosion Hazards: Methanol and p-xylene are severe fire and explosion hazards when exposed to heat or flame. Vapors are heavier than air and may travel a considerable distance to a source of ignition and flash back. Vapor and air mixtures are explosive.

Extinguishing Media: Use alcohol-resistant foam, dry chemical, carbon dioxide, or water spray.

Special Fire Procedures: Fire fighters should wear a self-contained breathing apparatus (SCBA) with a full face piece in the pressure demand or positive mode and other protective clothing.

SECTION V. REACTIVITY DATA

Stability: **X** **Stable** ___ **Unstable**

Stable at normal temperatures and pressure.

Conditions to Avoid: Avoid contact with heat, sparks, flames, or other sources of ignition. Avoid inhalation of vapors or combustion by-products. Avoid contact with the skin. Do not allow the material to contaminate water sources.

Incompatibility (Materials to Avoid): This material is incompatible with halo carbons, combustible materials, metals, oxidizing materials, halogens, metal carbide, amines, acids, and bases.

See Section IV**: "**Unusual Fire and Explosion Hazards".

Hazardous Decomposition or Byproducts: Thermal decomposition products may include toxic oxides of carbon.

Hazardous Polymerization: ___ **Will Occur** **X** **Will Not Occur**

SECTION VI. HEALTH HAZARD DATA

Route of Entry: **X** **Inhalation** **X** **Skin** **X** **Ingestion**

Methanol: Methanol is a skin and eye irritant and can cause nerve damage. This material is harmful if inhaled or absorbed through skin. Ingestion may be fatal or cause blindness. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting. Exposure can cause damage to the eyes, liver, heart, and kidneys. Methanol may also cause gastrointestinal disturbances and convulsions.

p-Xylene: p-Xylene may be harmful by inhalation, ingestion, or skin absorption. As a vapor or mist, p-xylene is irritating to the eyes, mucous membranes, and upper respiratory tract. Irritation of the upper respiratory tract may occur by inhalation of vapors at 200 ppm. Inhalation to higher concentrations may cause more severe irritation and initial central nervous system excitation. Symptoms may included respiratory difficulty, chest pain, euphoria, headache, nausea, vomiting, abdominal pain, dizziness, drowsiness, and anorexia. Repeater or prolonged inhalation of vapors above 200 ppm may cause similar symptoms as acute exposure. Lung damage may occur if aspirated into the lungs and may be fatal.

Medical Conditions Generally Aggravated by Exposure: p-Xylene may affect central nervous system disorders. **Methanol** may affect eye disorders, kidney disorders, skin disorders, and allergies.

Listed as a Carcinogen/Potential Carcinogen (Methanol):

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens		X
In the International Agency for Research on Cancer (IARC) Monographs		X
By the Occupational Safety and Health Administration (OSHA)		X

Listed as a Carcinogen/Potential Carcinogen (p-Xylene):

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens		X
In the International Agency for Research on Cancer (IARC) Monographs		X
By the Occupational Safety and Health Administration (OSHA)		X

EMERGENCY AND FIRST AID PROCEDURES:

Skin Contact: Remove contaminated shoes and clothing. Rinse affected area with large amounts of water followed by washing the area with soap and water. Watch for chemical irritations and treat them accordingly. Obtain medical assistance if necessary.

Eye Contact: Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Obtain medical assistance.

Inhalation: If inhaled, move the victim to fresh air. If breathing is difficult, give oxygen; if the victim is not breathing, give artificial respiration. Obtain medical assistance if necessary.

Ingestion: If ingested, wash out mouth with water. Obtain medical assistance immediately.

SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Steps to be Taken in Case Material Is Released or Spilled: Notify safety personnel of major spills and/or leaks. Evacuate nonessential personnel. Avoid heat, flames, sparks, and other sources of ignition. Stop the leak if one can do so without risk. Absorb small spills with sand or other non-combustible absorbent material and place into containers for proper disposal.

Waste Disposal: Follow all federal, state, and local laws governing disposal. Methanol is subject to disposal regulations U.S. EPA 40 CFR 262, Hazardous Waste Number U154. p-Xylene is subject to disposal regulations U.S. EPA 40 CFR 262, Hazardous Waste Number U239

Handling and Storage: Persons handling this material must wear protective eyewear, clothing, and gloves to prevent contact with this material. Methanol is subject to storage regulations U.S. OSHA 29 CFR 1910.106. Keep methanol and p-xylene separated from incompatible substances.

> **NOTE:** Contact lenses pose a special problem; soft lenses may absorb irritants and all lenses concentrate them. **DO NOT** wear contact lenses in the laboratory.

SRM 3005 should be stored in the dark at temperatures between 10 °C and lower than 30 °C, in a well-ventilated area away from incompatible materials and conditions. Protect containers from physical damage.

SECTION VIII. SOURCE DATA/OTHER COMMENTS

Sources: MDL Information Systems, Inc., MSDS p-*Xylene*, 17 June 2004.
MDL Information Systems, Inc., MSDS *Methyl Alcohol*, 16 December 2004.

Disclaimer: Physical and chemical data contained in this MSDS are provided only for use in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data on the MSDS. The certified value for this material is given in the NIST Certificate of Analysis.